Future FELLOWS

September 2007, Volume 13, No. 3

Part of Exam 3 to be Offered Jointly with SOA/CIA in 2008

Starting with the May 2008 examination sitting, the financial economics segment of CAS Exam 3, Actuarial Models, will be jointly administered with the Society of Actuaries (SOA) Exam MFE. The financial economics segment of CAS Exam 3 will be renamed Exam 3F. The CAS life contingencies and statistics segment of Exam 3 will be renamed Exam 3L.

Exam 3F/MFE will be offered as a two-hour exam. Exam 3L will be offered solely by the CAS and will be a two-and-a-half-hour exam. The CAS will grant a waiver for CAS Exam 3L to those who pass SOA Exam MLC.

Two issues led the CAS Board of Directors and the SOA Board of Governors to approve the joint offering. First, starting in May 2007, the SOA divided Exam M into 2 segments: financial economics (Exam MFE) and life contingencies (Exam MLC). The purpose of this segmentation was to accommodate the SOA's new Enterprise Risk Management credential. The CAS Board felt that this provided an opportunity for the financial economics material to be tested jointly with the CAS.

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CAS Board Discusses White Paper on Education Strategy

The CAS Board of Directors provided the following summary of its discussion of the White Paper on CAS Education Strategy that was held on June 17, 2007.

In the last board meeting a small board-level task force was appointed to review the proposals of the White Paper in light of membership feedback. The task force recommends:

- Moving the CPCU-type topics from Exam 5 to a CAS-administered Internet course.
- Reconfiguring the remaining portions of Exams 5-9 into four exam units instead of five (recognizing that portions of Exam 8 were recently moved to Exams 2 and 3).

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Dates to Remember

Fall Exam Registration Deadlines

There is only one deadline for each set of exams. Late registrations will not be accepted.

September 20, 2007
Exams 3, 6, and 9

September 24, 2007
Exams 2/FM and 4/C

October 4, 2007
Exam 1/P

Refund Deadlines

Exam 1/P
November 25, 2007 and noon of the second business day before test appointment

Exams 2/FM and 4/C
October 31, 2007

Exams 3, 6, and 9
October 29, 2007

CAS Seminars and Meetings

Casualty Loss Reserve Seminar
September 10-11, 2007
Marriott San Diego Hotel & Marina
San Diego, California

Predictive Modeling Seminar
October 11-12, 2007
Riviera Hotel & Casino
Las Vegas, Nevada

Reserve Variability Limited Attendance Seminar
October 14-17, 2007
The Sheraton Society Hill
Philadelphia, Pennsylvania

CAS Annual Meeting
November 11-14, 2007
Chicago Marriott Downtown Magnificent Mile
Chicago, Illinois

Preparing for New Code of Professional Ethics for Candidates

By Mark J. Larson, Candidate Representative to the Candidate Liaison Committee

Ah, 2008—a year that will bring us 29 days in February, U.S. presidential elections, the Olympics in China, and the CAS Code of Professional Ethics for Candidates (the code). While the last item listed may not qualify as breaking news, it is something with which all exam takers ought to be familiar.

Beginning on January 1, 2008, candidates who register for a CAS-specific exam will be required to sign a statement on the application form to agree to abide by the terms and conditions of the code. Candidates will be responsible to adhere to the code until Associateship or Fellowship with the CAS (whichever comes first) is achieved. At that point, the more detailed CAS Code of Professional Conduct will supersede the CAS Code of Professional Ethics for Candidates.

Individuals who have passed exams, are not Associates or Fellows, and do not take an exam in 2008 or later, will not be bound by the code (i.e., the code is not retroactive). So, if you will still be taking exams in 2008 and afterwards, be sure to take some time to familiarize yourself with the code and how it applies to your work and profession.

The Code of Professional Ethics for Candidates includes seven rules:

1. An Actuarial Candidate shall act honestly, with integrity and competence, to uphold the reputation of the actuarial profession.
2. An Actuarial Candidate shall not engage in any professional conduct involving dishonesty, fraud, deceit, or misrepresentation, or commit any act that reflects adversely on the actuarial profession.

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Read the First Issue of *Variance*

The first issue of *Variance: Advancing the Science of Risk* is out and the second issue is coming soon. Visit www.variancejournal.org to hear audio recordings of paper presentations, learn tips on writing a paper, and, of course, read the articles.

The premiere issue includes "Risk Transfer Testing of Reinsurance Contracts" where David L. Ruhm and Paul J. Brehm summarized key results from the Research Working Party on Risk Transfer. Roger M. Hayne wrote "Extended Service Contracts, An Overview" as a primer for the actuary or risk professional interested in either working in or understanding extended service contracts. In "Loss Reserves Estimates: A Statistical Approach for Determining 'Reasonableness,'" Mark R. Shapland reviews some current actuarial practices and examines how they relate to the question of what is "reasonable" from a statistical perspective. The journal also boasts "The Common Shock Model for Correlated Insurance Losses," by Glenn G. Meyers; "Obtaining Predictive Distributions for Reserves Which Incorporate Expert Opinion," by Richard J. Verrall; "Modeling Mortgage Insurance as a Multistate Process," by Greg Taylor and Peter Mulquiney; and "Multivariate Copulas for Financial Modeling" by Gary G. Venter, Jack Barnett, Rodney E. Kreps, and John Major.

Non-CAS members who wish to receive a complimentary copy of the first and second issues are welcome to submit their request via the *Variance* Web Site. CAS members, Academic Correspondents, and Subscribers will automatically receive the journal.

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3. An Actuarial Candidate shall perform Actuarial Services with courtesy and professional respect and shall cooperate with others in the Principal's interest.
4. An Actuarial Candidate shall adhere to the CAS Policy on Examination Discipline.
5. Actuarial Candidates are not authorized to use membership designations of the CAS until they are admitted to membership by the CAS Executive Council.
6. An Actuarial Candidate shall not disclose to another party any confidential information unless authorized to do so by the Principal or required to do so by law, statute, or regulation. Confidential information includes information of a proprietary nature and information that is legally restricted from circulation.
7. An Actuarial Candidate shall respond promptly, truthfully, and fully to any request for information by, and cooperate fully with, appropriate counseling and disciplinary body of the CAS in connection with any disciplinary, counseling or other proceeding of such body relating to the Candidate Code. The Actuarial Candidate's responsibility to respond shall be subject to applicable restrictions listed in Rule 6 and those imposed by law, statute, or regulation.

The Internet rumors regarding the enforcement of the code being carried out by the elite superteam of Harry Potter, MacGyver, Angelina Jolie, and Austin Powers are unfounded. Disciplinary procedures for the Code of Ethics will be similar to that of the CAS Code of Professional Conduct. Rules of Procedure for Disciplinary Actions Involving Candidates and the complete code are available in the "Admissions/Exams" section of the CAS Web Site.

FROM THE COVER

Part of Exam 3 to be offered jointly with SOA/CIA in 2008

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Second, the potential to offer this multiple-choice exam by computer-based testing (CBT) would be enhanced if the exam were offered jointly. The joint Examination Committee can begin the multi-year task of building its bank of questions that will be necessary before the exam can move to CBT. Candidates benefit from CBT as the frequency with which exams are administered would increase to at least four times per year. After a transition period of a few sittings, unofficial results will be provided to candidates before they leave the examination center.

From May 2000 through May 2003, CAS Exam 3 and SOA Exam M were administered as a joint exam. In October 2003, the CAS began to administer its own exam, reducing the focus on life contingencies topics. In 2005, additional topics in statistics were added to CAS Exam 3.

Exam 2/FM to be offered by Computer-Based Testing

In addition to approving the administration of Exam 3F/MFE as a joint exam, the CAS and SOA Boards approved entering into a contract with Prometric to move Exam FM/2 to computer-based testing as soon as practical. It is anticipated that this would take place sometime in 2008. After the contract has been completed and a final timetable set, details will be announced. The boards also voted to approve moving Exam 3F/MFE to CBT as soon as practical after Exam 2/FM has been converted.

CAS Board Discusses White Paper on Education Strategy

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- Adding a capstone seminar. The task force proposed that the capstone seminar would be a three- to five-day limited attendance seminar including a structured project to be completed individually by each participant, and suggested that offering candidates a variety of capstone seminars from which to choose could provide some of the benefits of the "specialty tracks" concept put forth in the original white paper while addressing concerns expressed by the membership.

The board asked the task force to analyze exam transition implications under various reconfiguration options and seek additional feedback from employers and chief actuaries.

$Y_i = \alpha + \beta_1 X_{i1} + \beta_2 X_{i2} + \ldots + \beta_k X_{ik} + \xi_i$ = Future

By Bradley J. Lipic, Candidate Representative to the Candidate Liaison Committee

The various methods that make up a company's pricing plan are all essentially predictive models. Classification plans, ILF methods, exposure methods, and other methods alike, all attempt to quantify, or predict, a measure of loss cost in a prospective period. However, the phrase "predictive modeling" does not usually refer to these methods. Rather, the phrase is normally associated with the application of generalized linear models, which utilize statistical techniques to relate a dependent variable to one or more independent variables. A generalized linear model expresses the relationship as a linear equation from a set of data observations on the variables used.

Generalized linear models (GLMs) are an expansion of ordinary least squares (OLS) regression. In OLS regression, the error terms are assumed normally distributed with homogeneous variance and are independent of each other. However, a response variable of interest may only have two possible outcomes, for example, claim vs. no claim. These Bernoulli-type, dependent variables inherently prohibit the error terms from following a normal distribution because the variance is a function of the mean. A *generalized* linear model relaxes these assumptions; it minimally "asks" that the distribution of errors be at least reasonably symmetric.

Application

There are many exciting applications taking place in the predictive modeling arena. Different lines of business are employing these models in ways that best fit their sector of the industry. The auto industry primarily uses them for pricing, as competition and its resulting pressure oblige finely tuned allocations of loss costs. There are many competitors, so it is vital that predictive models are constantly refined to give the correct price to the correct consumer. Lines that have relatively lower measurable claim frequency than auto, such as homeowners, medical malpractice, or reinsurance coverages, commonly do not use predictive models to price their business. Nonetheless, in these instances, predictive modeling can still provide a competitive advantage to "skim the cream" of available risks.

The output of models can be used in varying applications to assist with identifying risk. If the output of a model is an estimate of loss costs, it can subsequently be used as a method to indicate future expected loss costs. The outputs can also serve as relativities to a benchmark indicating a credit or debit. For example, the output of the model for an account can be taken as a ratio to a class wide median. The resulting ratio could serve as an indication of a credit or debit to the account.

Predictive models are migrating to other departments such as marketing, finance, and underwriting. Underwriting tools are being created to preliminarily measure a customer's inherent likelihood to pierce a subject layer by having the model produce a yes or a no, along with a probability of confidence. Consequently, these types of tools can assist underwriters in deciding whether to accept or reject a risk. Models that result in categorical answers are typically modeled via logistic regressions.

Complications

Insurance companies typically consider the variables used in their models to be proprietary. Some insurance companies use a black box approach where they mask the variables so that competitors will not understand what variables are being used as predictors. However, the challenge remains to inform customers of the rating variables that are used to describe risk. Intuition and customer controllability of the variables remain favorable but not obligatory. For many lines of insurance, predictive modeling is in the beginning stages, especially for those lines that are difficult to model due to the increased variability of loss exposures with low claims frequency and high claims severity.

As in just about all actuarial work, the biggest speed bump in progression is the data. Howard Mahler, FCAS, once said, "An analysis performed by an actuary is no better than the quality of the data that goes into the analysis." The data collection step is the most time-consuming and consequential stage of the modeling process. When attempting to model a dependent variable where data is sparse, the design of predictive modeling is precluded. Due diligence needs to be exercised to identify issues surrounding dubious data, multicollinearity, and observations with an undue influence. After the model has been trained, the resulting estimates are measured for its overall accuracy.

Model accuracy is measured in several ways. Commonly, there are validation steps that hold out data. For example, assume one has data for years 2000 through 2006. The 2000 through 2005 data is used to train the model. Accuracy is then measured by applying the model to the 2006 input data, acting as if the 2006 claim experience data (output data) is unknown. This method serves as a proxy for predicting the future. If the 2006 data is not trained in the model, it can then be considered the future and analyzed for accuracy by comparing true experience to the output of the model.

Another time-consuming speed bump occurs when the resulting model produces unexpected results. For example, a model suggesting lower auto loss costs for a 17-year-old than a 35-year-

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old (ceteris paribus) would be counterintuitive for a number of reasons. Much time can be spent considering and investigating reasons for the unexpected results. Usually, major adjustments or recreating the data set become essential.

Acceptance of the model is also dependent on the complement of credibility. For situations such as hurricane insurance, where there are neither ample data points nor ample data sources, complements of credibility are also minimal, resulting in output receiving implicit credibility of unity. If there are credible complements, statistics such as R^2 (measuring the amount of variation explained by the GLM) can assist in determining how much credibility is assigned to the output of the model.

Receptiveness is another hurdle to the implementation of predictive models. The modeler should be able to communicate from an underwriting perspective that estimated loss costs do not need to be 100% judgmental, as they can be quantifiable. As predictive modeling becomes more widely accepted, the receptiveness of management follows. When presenting these models to management, presentations should be objective in nature and accompanied by clarifying charts and graphs. The presenter must be able to clearly communicate the results by intuitively understanding and explaining the output. If this is achieved, management will be more likely to approve. Once management concurs with the model, gaining acceptance from the customer usually requires less effort. Most customers are unaware of current relativities and methods; thus explaining model intricacies is superfluous. However, clients, from a consulting perspective, like the predictive models because they may help in minimizing adverse selection. The underlying challenge is curtailing complexity.

Future

Predictive modeling is quickly gaining widespread popularity as it is becoming a common technique in many actuarial departments. For industries such as those with frequency and severity characteristics similar to the auto industry, it has become critical for companies wanting to maintain a competitive edge. The excitement from implementing predictive models permeates actuarial departments and management, increasing the statistical sophistication in many lines of work.

Discover

A number of statistical texts have been published on the topics of generalized linear models. An effortless query searching for "GLM" should return a plethora of sources in any search engine that contains mathematical documents. It is commonly recommended that any materials used coincide with the software that will be used to congregate the models. The CAS and SOA also host predictive modeling seminars, which could serve as additional resources as well as opportunities to network with others in the field or looking to introduce predictive modeling into their work environment.

Acknowledgements

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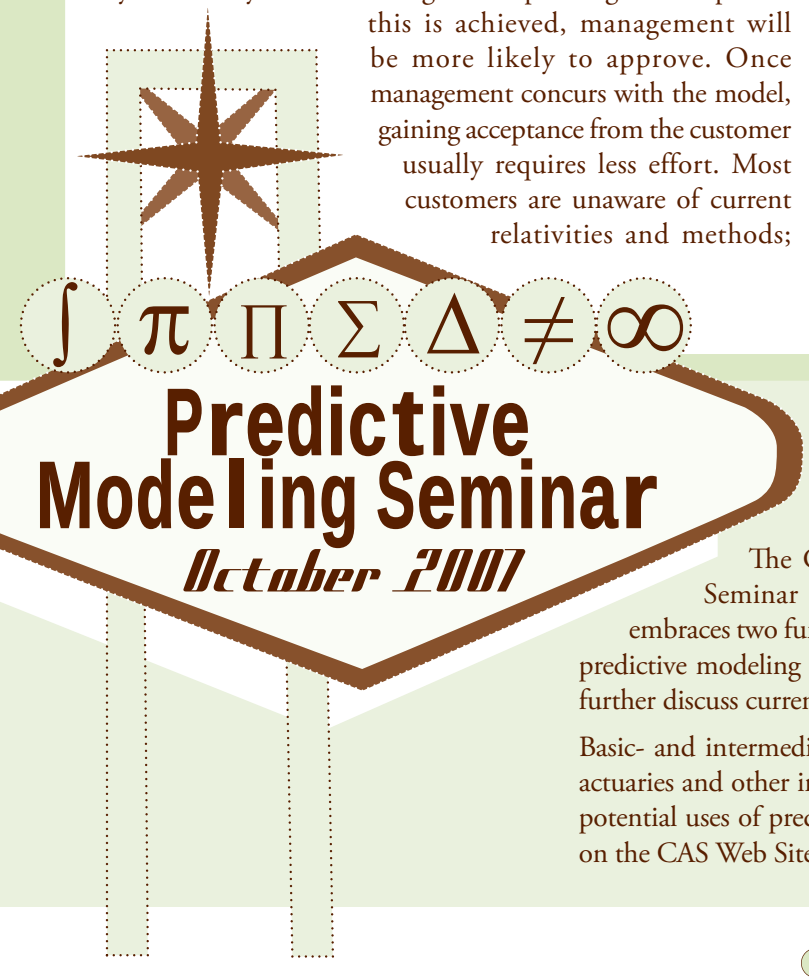


The Casualty Actuarial Society is offering a Predictive Modeling Seminar October 11-12, 2007, in Las Vegas, Nevada. The seminar embraces two fundamental concepts. The first goal is to educate attendees about predictive modeling techniques relevant to insurance companies. The second is to further discuss current and future insurance applications of predictive models.

Basic- and intermediate-level sessions will be offered. The seminar is intended for actuaries and other insurance professionals at all levels who wish to learn about the potential uses of predictive modeling in their work. Additional details are available on the CAS Web Site (www.casact.org).

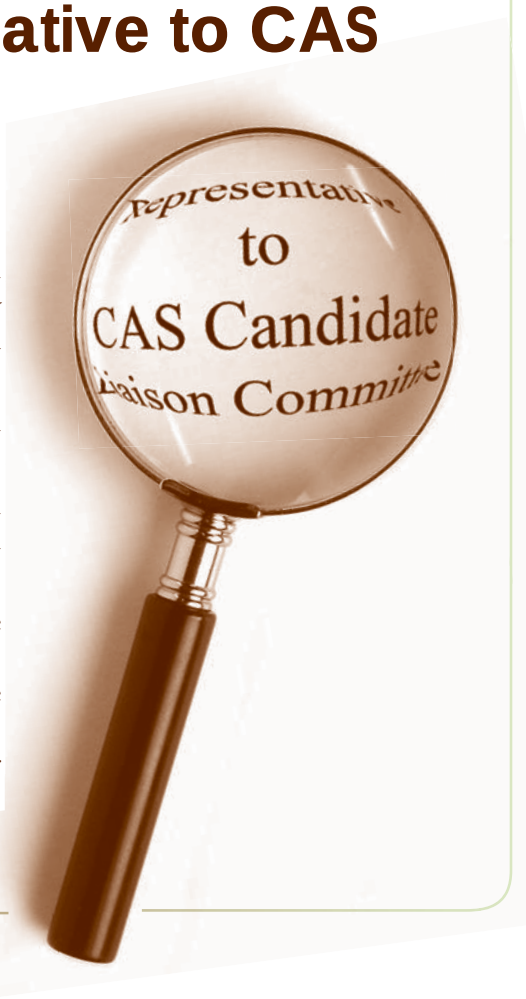
Candidate Sought for Representative to CAS Candidate Liaison Committee

The CAS Candidate Liaison Committee is looking for a person taking CAS exams to join the committee as an official candidate representative. The selected person would be an active participant on the *Future Fellows* editorial board. The representative would be responsible for presenting candidate views to the committee to help identify issues that should be addressed by the CAS. The candidate must meet the following requirements:

- Be a candidate for the Casualty Actuarial Society;
- Be active in the examination process (must have sat for a CAS examination within the last two sittings);
- Be willing to serve a two-year term;
- Participate in the Candidate Liaison Committee meetings (quarterly telephone conferences and an annual in-person meeting); and
- Provide one letter of reference from a member of the CAS.

The new representative will be selected in October and would begin a two-year term in December.

An application is available in the "Admissions/Exams" section on the CAS Web Site (www.casact.org) or may be obtained by contacting the CAS Office. The application deadline is September 28, 2007.



Planning Ahead for the Course on Professionalism

By Shira Jacobson, Candidate Representative to the Candidate Liaison Committee

The Course on Professionalism (COP) stands as one of the least onerous steps on your path to becoming a credentialed actuary. Instead of a written exam, you spend a couple of days listening to presentations, participating in discussions, and generally improving your understanding of the standards that you will abide by over the course of your career. In fact, active, positive participation is the main requirement for the COP. In recent years, several offerings of the Course have quickly filled to capacity, leaving some candidates without their first choice of location or time. In some instances, candidates have become concerned that the COP would delay their progress to the credential.

The CAS has recently responded to these concerns by offering additional sessions of the COP. Three sessions were originally scheduled for June 2007. A fourth course was added, taking place in August 2007, with candidates' concerns in mind. Another recent change, making candidates eligible for the COP upon completion of six exams, or five exams plus all VEE requirements, is expected to help better distribute the demand for course registration.

Candidates have also expressed concern that COP locations and dates are published with limited advance notice. The CAS maintains a policy of publishing details once a final agreement is in place with the host location – this ensures that COP sessions occur as planned, with no need for last-minute cancellations or relocations.

With these updates in mind, it makes sense to register for the COP early. If you can fit it in, register soon after you meet the eligibility criteria; it's best not to wait for the COP to come to your ideal destination. Keep in mind that the December COP offerings often have more open spaces than do the spring and summer offerings. Finally, you can register promptly even if your employer issues only paper checks. Fax your registration materials to the CAS, and a paper check can follow up to the payment due date.

By effectively planning the COP as part of your actuarial education, you can continue smoothly to your credential. For current information on COP offerings, visit the CAS Web Site (http://www.casact.org/education/index.cfm?fa=prof).

Resources & Reminders

The "Admissions/Exams" section of the CAS Web Site includes:

- All updates to the *Syllabus of Basic Education*
- "Notice of Examinations"
- "Verify Candidate Exam Status" to confirm that joint exams and VEE credits are properly recorded
- CAS Regional Affiliates have their own section on the CAS Web Site
- Feedback button to the Candidate Liaison Committee

If you have not received a confirmation of your registration for Exams 3, and 5-9 two weeks prior to the registration deadline, please contact the CAS Office.

NEW: Please note the new refund policy. Refunds must be requested prior to exam dates. Please check the *Syllabus* for specific refund deadlines.

Remember your Candidate Number!

Candidate Liaison Committee Mission

The Candidate Liaison Committee communicates with CAS candidates, collectively and individually, who are taking CAS examinations. The committee informs candidates as to appropriate courses of action available to them. Through periodic communication, this committee informs candidates of results of examination administrations, actions taken on complaints received regarding examination questions, and reasons for syllabus and examination changes being implemented. Communication encompasses existing policies and procedures as well as changes being considered. The committee should advise the CAS and its committees of the interests of the candidates regarding matters that come before the CAS and its committees. Candidates may contact the Candidate Liaison Committee at the CAS Office address. The Casualty Actuarial Society is not responsible for statements or opinions expressed in the articles, discussions, or letters printed in *Future Fellows*.

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Results of Spring 2007 Examinations

SUMMARY OF SPRING 2007 EXAMINATIONS

Exam	Number of Candidates	Number of Passing Candidates	Number Below 50 of Pass Mark (Ineffective)	Effective Pass Ratio
1/P	3519	1289	429	41.7%
2/FM	4043	1929	375	52.6%
3	357	121	72	42.5%
4/C	2079	887	104	44.9%
5	892	396	63	47.8%
7-Canada	80	35	2	44.9%
7-US	459	181	24	41.6%
8	418	192	26	49.0%

SUMMARY OF SPRING 2007 EXAM SURVEY

Exam	Percent Responding	Syllabus Coverage *Inadequate (1) to Adequate (5)*	Exam Clarity *Not Clear (1) to Very Clear (5)*	Exam Length *Too Short (1) to Too Long (5)*	Exam Difficulty *Easy (1) to Difficult (5)*	Exam Quality *Poor (1) to Excellent (5)*
2/FM	6.26%	3.72	3.58	3.14	3.35	3.51
3	34.17%	3.37	2.83	3.33	4.17	2.73
4/C	15.75%	3.14	2.79	3.78	4.49	2.76
5	20.63%	3.85	3.65	4.14	3.52	3.46
7-Canada	38.75%	3.42	3.39	3.10	3.52	3.45
7-US	25.49%	3.57	3.34	3.73	3.62	3.42
8	26.79%	3.22	2.57	4.24	3.92	2.82

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